

CALFED Bay-Delta ERPP/HCP Comments

General

We would like to point out that the broad-scale effects of dams, diversions, levees and stream channelization resulting in the destruction of wetland and riparian habitats in the Bay-Delta watershed have had direct negative consequences for many native species of California birds. Although the Ecosystem Restoration Program Plan targets a few of those species due to their special status, the true tally of bird species that have declined is far larger. For this reason, we advocate that impacts such as reduced areal extent of habitat; reduction in width of riparian corridors; and loss of natural processes such as flooding, stream meander and tidal action all be addressed through the Bay-Delta program in a manner consistent with the need to protect and increase our native bird populations. Consequently, CALFED ecosystem restoration goals and adaptive management must benefit bird habitat and populations as well as aquatic species.

Additionally, statements of purported fact are made in this document but no citations are provided to substantiate these statements. This is the case for most of the Species Visions. This is especially a problem for those Species Visions which are quite specific. For example, for Suisun Song Sparrow, it is stated that the Suisun Song Sparrow is found in 13 isolated populations, with a total population of fewer than 6,000 pairs. No citations, whether published or unpublished reports, are provided. If unpublished reports are being relied upon, these should be cited, together with information so that readers may obtain copies of the report.

Ecosystem Restoration Program Plan, Volume I

1. Visions:

We appreciate the references to coordination with the Riparian Habitat Joint Venture (RHJV), of which Dan Evans, Point Reyes Bird Observatory, is currently chair. However, coordination with the RHJV should also entail consistency with the goals of our *Riparian Bird Conservation Plan*, which will be released in draft this summer and will be completed by the end of the year. This plan has received input from experts around the state, for example Steve Laymon developed the information relative to Yellow-Billed Cuckoos and Barbara Kus is developing the information relative to Bell's Vireo. Like the North American Waterfowl Management Plan, the Riparian Bird Conservation Plan will establish target populations as well as priority habitat restoration and management areas in California for a number of riparian obligate or dependent bird species, including the Swainson's Hawk (p. 230), the Yellow-Billed Cuckoo (p. 242), the Bank Swallow (p. 243), the Yellow Warbler, Common Yellowthroat, Wilson's Warbler, Yellow-Breasted Chat, Bell's Vireo, Warbling Vireo, Swainson's Thrush, Blue Grosbeak, Black-Headed Grosbeak, and Willow Flycatcher—all neotropical migratory birds (p. 264). Therefore we ask that the visions for the neotropical migratory bird guild, the Yellow Billed Cuckoo, the Bank Swallow, and the Swainson's Hawk all be implemented "consistent with the goals of the RHJV's Riparian Bird Conservation Plan." Additionally, the Riparian Bird Conservation Plan should be referenced relative to neotropical migrants on p. 13.

2. Stream meander, Dam Release Schedules, and Natural Floodplains (p. 38-46):

We support the concept of modifying reservoir storage management during wet years to simulate the seasonal pattern of natural, short-duration flood peaks, which will hopefully contribute to meander formation. We believe that flood processes, natural flood plains, meander formation and the riparian succession that accompanies these processes are key to a number of neotropical migrants and resident songbirds that are dependent upon early seral stage riparian habitat, which has been one of the most affected types of riparian habitat in the Central Valley. Our research and monitoring show that the Modesto Song Sparrow and the Yellow Warbler have been extirpated from a significant portion of their former range in the Central Valley in the past 20 to 50 years. We believe that loss of natural flooding processes contributing to river meander and riparian willow scrub formation may be a significant contributor to this decline.

On the other hand, as with all cases when man's management must substitute for natural processes, managed pulse flows must be carefully timed not only to benefit aquatic species but also to avoid detrimental impacts to the Bank Swallow. Pulse flows or increased flows that would raise river levels 2-3 feet or more should be avoided during the months of April through June to avoid significant, potentially irrevocable impacts to nesting bank swallows. Bank swallows arrive on their breeding ground in California beginning in late March and early April, and the bulk of breeding birds arrive in late April and early May. Birds vacate their breeding grounds as soon as juveniles begin dispersing from the colonies around late June and early July. Limited band recovery records during the later part of the breeding season indicates that post-breeding dispersal occurs in the general vicinity of breeding populations. Breeding areas are essentially devoid of bank swallows by mid-July to early August.

References:

Garrison, Barry. 1998. Partners in Flight Conservation Plan, Bank Swallow Species Account.

See species range maps in GIS on PRBO's website @ www.prbo.org.

3. Riparian and Riverine aquatic habitats (p. 106-112):

We strongly suggest that "clearing/elimination of understory" be added to the list of primary stressors affecting riparian habitats on p. 108. Our research and monitoring has shown that lack of sufficient understory cover in riparian habitats is a contributor to decreased selection of the habitat for nesting and decreased nest success in several riparian dependent species of birds, including the song sparrow, blue grosbeak, and common yellowthroat. Conversely, bird response to dense understory growth after natural disturbances such as fire or flood has resulted in higher than average nest success.

Again, under Integration with other Restoration Programs, we would like to stress the importance of coordination with the RHJV's Riparian Habitat/Bird Conservation Plan. By selecting riparian projects on the basis of what will benefit native aquatic species *as well as* birds, the Bay-Delta Program will double the value of its ecosystem restoration expenditures. Additionally, our plan contains a number of recommendations on how to maximize species diversity in revegetation projects.

Phasing out or reducing livestock grazing in riparian zones will in most cases benefit birds. We would like to add that for cases where this type of riparian zone management results in economic hardship for private landowners, we are currently working in partnership with a number of ranchers in the Sacramento Valley to assess the benefits to birds and other wildlife of a holistic grazing management regime in riparian habitats. The Natural Resources Conservation Service (NRCS) has developed this grazing management program in cooperation with local landowners.

References:

Geupel, G.R., G. Ballard, N. Nur & A. King. Population status and habitat associations of songbirds along riparian corridors of the Lower Sacramento River: results from 1995 field season and summary of results 1993 to 1995. PRBO report, 1997

Geupel, G.R., G. Ballard & A. King. Songbird monitoring on the Cosumnes River Preserve: results from the 1995 field season. PRBO report, 1997

Geupel, G.R., A. King & G. Ballard. Songbird monitoring on the San Luis National Wildlife Refuge: results from the 1996 field season. PRBO report, 1997

King, A. & G.R. Geupel. Songbird response to revegetation efforts along the Sacramento River: results from the 1996 field season. PRBO report, 1997

Geupel, Geoffrey R., G. Ballard, and A. King. 1998. Songbird Monitoring on the Cosumnes River Preserve. Results from the 1995-97 field seasons. PRBO unpublished draft report to the Nature Conservancy.

Geupel, Geoff. 1996. The Unbalance of Nature, Songbirds in the Mount Vision Fire Zone in Observer, Number 108, fall 1996.

4. **Western yellow-billed cuckoo** (p. 241): "Integration with Other Restoration Programs" should include coordination with the Riparian Habitat Joint Venture. The following information encapsulated from the RHJV's Riparian Bird Conservation Plan should be added to this section:

Currently only about 30-50 pairs of Yellow-Billed Cuckoos are found in California, with the two main populations located in the Red Bluff to Colusa stretch of the Sacramento River and the Kern River near Lake Isabella. They have a large home range, up to 100 acres, average 50-60 acres per pair. Patch size issues are important. The width of riparian habitat must be at least 100 meters to benefit the Cuckoo. Sites greater than 200 acres in extent and wider than 600 meters, with greater than 65% canopy closure are optimal. Highest priority sites for restoration are those capable of producing large sites with high canopy cover and foliage volume, and moderately large and tall trees.

Cuckoos are known to use orchards for nesting, but less so for foraging, although reduced use of pesticides could potentially change that. Black walnut and fig trees, both common species along the Sacramento River, are not suitable habitat for the Yellow-Billed Cuckoo. The ideal target for habitat restoration to benefit the Cuckoo is to restore blocks

of habitat that will support 25 pairs per group (or subpopulation). This is because at 10 pairs, a subpopulation is barely stable. For a viable state population, the Cuckoo's distribution should be increased and the number of subpopulations increased to 25 locations -- a target of 625 pairs total.

References:

Laymon, Stephen A. 1998. Partners in Flight Bird Conservation Plan, Yellow-Billed Cuckoo Species Account.

5. **Bank Swallow** (p. 243): An important issue is not addressed in the Bank Swallow summary. We support the concept that partially restoring the processes that create nesting sites and promoting river meander belts will benefit this species. However, it should be noted that the Bank Swallow nesting season extends from late March through early July, varying with seasonal weather fluctuations, and during this time period, the swallows will be very vulnerable to "pulse flows" or "flushing flows." Pulse flows or flushing flows for fish and/or ecosystem process restoration should be prohibited (or at least severely curtailed and closely monitored) during the months of April through June. Bank Swallows arrive on their breeding ground in California beginning in late March and early April, and the bulk of breeding birds arrive in late April and early May. Birds vacate their breeding grounds as soon as juveniles begin dispersing from the colonies around late June and early July. Limited band recovery records during the later part of the breeding season indicates that post-breeding dispersal occurs in the general vicinity of breeding populations. Breeding areas are essentially devoid of bank swallows by mid-July to early August.

It appears that most places in the ERPP where pulse flows or modified dam releases are discussed, the month of March is the primary time targeted for such flows. This would not usually be in conflict with the needs of the Bank Swallow, particularly if flows were concentrated in the early half of the month. However, any such releases subsequent to April 1 could potentially result in the complete destruction of entire colonies. With the Sacramento River from Red Bluff to Colusa supporting 50% of the remaining Bank Swallow population in the state, this could have dire consequences. We also recommend that Bank Swallow colony monitoring should be a priority if managed flows to support channel formation (flushing or pulse flows) were necessarily undertaken from late March through June. Flows that would impact nesting colonies should be altogether avoided; these would most likely be flows raising river levels more than 2-3 feet.

References:

Garrison, Barry. 1998. Partners in Flight Conservation Plan, Bank Swallow Species Account.

6. **Suisun Song Sparrow** (p. 246):

a. The Suisun Song Sparrow is listed but Samuel's Song Sparrow (*Melodia melospiza samuelis*) is not listed; we feel both should be. They are both considered Species of Management Concern by the US Fish & Wildlife Service (formally deemed Candidate Species for Listing, Category II). The same Species Vision could be written to cover both Song Sparrow subspecies. Samuel's

Song Sparrow (which is restricted to San Pablo Bay) has the same habitat affinities and faces pretty much the same threats as the Suisun Song Sparrow.

b. Our own recent and current studies of the Suisun Song Sparrow, initiated with funding from USGS - Biological Resources Division (see Nur et al. 1997), do not agree with the statement (p. 246) "fewer than 6,000 pairs remain in 13 isolated populations...." We estimate considerably more pairs: over 12,000 pairs (Nur et al. 1997); even an estimate by Marshall & Dedrick (1994) was nearly 9,000 pairs. Our surveys suggest more than 13 populations. Nor do we agree that these populations are functionally isolated. Geographically, the populations may be confined to distinct, disjunct patches of habitat, but we question whether all of these are functionally (i.e., demographically) isolated. We have observed Song Sparrows to disperse several miles, across stretches of unsuitable habitat.

c. Sources of egg and nestling mortality are listed as "predation ... by the introduced Norway rat, predation on nestling by feral house cats, and flooding of nests..." Our own extensive studies (1996 - 1998) support flooding as a major source of mortality; feral cat predation appears to be important in some areas but not others; we do not find evidence of Norway rat predation.

d. The statement is made: "egg and nestling mortality is about 50% in the first 3 weeks after eggs are laid." If mortality were only 50% this would be a very healthy population indeed! Song Sparrows can tolerate high mortality rates (of greater than 50%) because they frequently re-nest. The Point Reyes Bird Observatory's studies of Song Sparrows indicate that even healthy populations suffer mortality of about 70%. We have found that (depending on the marsh and depending on the year) mortality rates of Suisun Song Sparrows are 70 to 95% (Nur et al. 1997, and N. Nur, G. Geupel, Y. Chan, unpublished). Any mortality rates exceeding 70% (and especially those of 90% or more) are of great concern.

e. The text on pages 246 and 247 implies that Song Sparrows may include levees in their territories but do not center their territories in vegetation found on levees. We have found that Suisun Song Sparrows will center their territories on levees.

f. The Vision for the Suisun Song Sparrow includes reducing breeding stressors, a view with which we agree. The penultimate sentence of the Vision states, "The possibility of managing breeding of the species to increase its reproductive success should be investigated (e.g., transferring eggs and/or young between nearby isolated populations to increase genetic interchange between populations)." The first half of the sentence we agree with; the second half of the sentence (the parenthetical clause) does not logically follow the first half and, furthermore, we strongly disagree with the suggestion made. We agree with the recommendation to manage the Suisun Song Sparrow so as to increase its reproductive success (see point #5 above). However we strongly disagree that transferring eggs and/or young would be recommended. First of all, egg or young transfer would hardly serve to improve reproductive success, which is low due to predation and flooding (see point #4). Second, there is no evidence that geographically isolated populations are genetically isolated (see point #3). Third, exchange of eggs or young would only serve to genetically homogenize the set of Suisun Song

Sparrow populations, thus breaking up incipient genetic differentiation. This we see as detrimental to the subspecies.

References:

Marshall, J.T. and K.G. Dedrick. 1994. Endemic Song Sparrows and Yellowthroats of San Francisco Bay. Pp. 316-327 in N. K. Johnson & J. Jehl (Eds.), *A Century of Avifaunal Change in Western North America*. Studies in Avian Biology 15.

Nur, N., Zack, S., Evens, J. and Gardali, G. 1997. Tidal Marsh Birds of the San Francisco Bay Region: Status, Distribution, and Conservation of Five Category 2 Taxa. Draft Final Report of the Point Reyes Bird Observatory to United States Geological Survey-Biological Resources Division. Available from Point Reyes Bird Observatory, Stinson Beach, CA 94970.

7. Shorebird and Wading Bird Guild (p. 255): Under "Vision", "project" wetlands and wading bird nesting areas should be changed to "protect." Add the following as an Implementation Objective: Increase the quantity and quality of breeding habitat and forage on agricultural land. This is in direct support of a similar goal for waterfowl, since shorebirds and waterfowl use many of the same wetland habitats in the Central Valley, Delta and Suisun Marsh.

8. Neotropical Migratory Bird Guild (pp. 264-265): The section justifying a focus on neotropical birds should be strengthened with the following information.

Birds are critical components of our ecosystem, culture, and economy. For example, many passerine species (including neotropical migrants) play an indispensable role in control of forest and agricultural insect pests, saving millions of dollars in the application of deleterious pesticides. Additionally, birdwatching is the fastest growing outdoor recreation and is currently enjoyed by an estimated 65 million Americans. The 1994-95 National Recreation Survey (U.S. Dept. of Interior) shows that over the past decade participation in birdwatching nationwide has increased 155%, compared to a decrease in fishing of 4% and a decrease in hunting of 12%. Non-consumptive bird use contributes 16,000 jobs and more than \$622 million in retail sales annually to the California economy, which leads the nation in economic benefits derived from birders. A 1993-94 study of the Salton Sea area, for example, found that 54,000 people spent \$3.1 million in that area alone while watching birds.

The Point Reyes Bird Observatory's 30-year database (the oldest west of the Mississippi) has demonstrated significant declines in 17 western bird species, including neotropical migrants and winter residents.

Birds, because of their diverse ecological needs and high position on the food chain, provide an ideal measure of overall habitat quality.

References:

What's a Bird Worth? Bird Conservation, spring 1997.

Saving the Salton Sea, A Research Needs Assessment. U.S. Fish & Wildlife Service.

The time period during which this guild of birds depends upon the flora of California to migrate, forage and reproduce should be expanded from May-September to *March-October*. Neotropical migrants are present in California during these spring and fall months. Many species initiate nesting in April.

We recommend that the vision for the neotropical migratory bird guild be "to maintain and increase healthy populations of neotropical migratory birds by restoring the habitats on which they depend *at levels that can support nonconsumptive use and ecosystem function, consistent with the goals and objectives of the Riparian Habitat Joint Venture's Riparian Bird Conservation Plan*" Measures of ecosystem function that can be provided through monitoring of this guild include species diversity, abundance, productivity, reproductive success and recruitment. Just as riparian and riverine aquatic habitat actions are proposed in all 14 ecological zones defined by the Bay-Delta program (p. 79), the vision for achieving conservation of neotropical migrants should encompass all 14 ecological zones.

Under Implementation Objectives, Targets and Programmatic Actions, we strongly recommend that the following be added as an objective:

- Increase productivity of neotropical birds in the Central Valley. This is an important goal because increases in distribution and abundance will not necessarily guarantee viability of the entire population due to source/sink dynamics.

We also recommend that the following programmatic actions be added:

- Improve management of riparian understory habitat to ensure adequate vegetative cover to support nesting.
- Establish new programs or expand existing programs to provide incentives for landowner participation in improved habitat/orchard management programs. Research and monitoring we have conducted shows that neotropical migrants and resident native birds respond positively to integrated pest management in orchards bordering riparian zones. A cover crop reduces feeding areas for parasitic cowbirds and decreased use of pesticides may contribute to increased foraging and nesting within orchards. Keep in mind that the neotropical migrants targeted by this program are primarily insect eaters, and would augment agricultural crops rather than harming them.
- Establish programs that allow government agencies and bird research/conservation organizations to work cooperatively to increase the efficiency of existing strategies and land bird/riparian management plans.

References:

Minutes from the California Riparian Habitat Joint Venture Meeting, 3-13-98 Santa Nella.

Ecosystem Restoration Program Plan, Volume II

The following comments apply to a number of Ecological Zones discussed in Volume II, as noted.

1. Visions for Species

A section on benefits to the Neotropical Migratory Bird Guild has been omitted and should be added to the "Vision for Species" section in each of the following Bay-Delta Program Ecological Zones: the Sacramento River, North Sacramento Valley, and the Eastside Delta Tributaries Ecological Zones. This is an egregious oversight. The Point Reyes Bird Observatory possesses ample data demonstrating the prime importance of riparian habitats in these ecological zones to neotropical migratory and resident birds, and these zones are a prominent focus of the RHJV *Riparian Bird Conservation Plan*. Riparian restoration in these three zones will benefit neotropical migrants significantly. Over seven years worth of data collected by the PRBO and cooperating agencies, such as the Fish & Wildlife Service and the Forest Service, show that certain riparian habitats in these ecological zones have exceptionally high species diversity and productivity, and might even be considered "source" areas. On the other hand, data also show that certain riparian areas within these ecological zones have suffered a loss of species diversity, and species such as the Modesto Song Sparrow and Yellow Warbler have been extirpated from substantial portions of their range here over the past 30 years. In particular, I would like to point out that a recent "rapid assessment" of the bird community along Clear Creek, downstream from the McCormick dam indicates that this riparian zone supports extremely high bird diversity and represents an excellent opportunity to conduct a coordinated riparian/aquatic restoration program with integrated benefits for birds and anadromous fish.

References:

Geupel, G.R., G. Ballard, N. Nur & A. King. Population status and habitat associations of songbirds along riparian corridors of the Lower Sacramento River: results from 1995 field season and summary of results 1993 to 1995. PRBO report, 1997

Geupel, G.R., G. Ballard & A. King. Songbird monitoring on the Cosumnes River Preserve: results from the 1995 field season. PRBO report, 1997

Geupel, G.R., A. King & G. Ballard. Songbird monitoring on the San Luis National Wildlife Refuge: results from the 1996 field season. PRBO report, 1997

King, A. & G.R. Geupel. Songbird response to revegetation efforts along the Sacramento River: results from the 1996 field season. PRBO report, 1997

Geupel, Geoffrey R., G. Ballard, and A. King. 1998. Songbird Monitoring on the Cosumnes River Preserve. Results from the 1995-97 field seasons. PRBO unpublished draft report to the Nature Conservancy.

Nur, N., G.R. Geupel & G. Ballard. Assessing the impact of the Cantara spill on terrestrial bird populations along the Sacramento River: results from the 1993 field season. Report to California Department of Fish and Game, 1994

A section on benefits to the Shorebird and Wading Bird Guild has been omitted and should be added to the "Vision for Species" section in each of the following Bay-Delta Program Ecological Zones: The Colusa Basin, Butte Basin, Sacramento River, Feather River Basin, American River Basin, Eastside Tributaries, and West San Joaquin Basin. In fact, each Ecological Zone for which waterfowl are listed as target species should also include the shorebird and wading bird guild, since they tend to use the same wetland habitats throughout the Central Valley. In 1993, PRBO conducted exhaustive spring and fall censuses of all wetland habitats in the Sacramento Valley, San Joaquin Valley, Delta and Suisun Marsh. Combined with earlier census data that provided good estimates of shorebird usage of San Francisco Bay and other wetlands along the Pacific coast, these data indicated that the Central Valley, Delta and Suisun Marsh wetland systems hold one of the largest wintering concentrations of shorebirds in Western North America. Counts estimated that these areas held 25% of the total shorebirds in the California Coast/Valley wetland system during spring, fall and early winter. Rice fields were an important component of wetland habitat used by shorebirds; they held 41% of total shorebirds in the Sacramento Valley in spring (April), 26% in the fall (August) and 68% in early winter (Nov).

Whereas shorebirds are targeted in the Delta and Suisun/North Bay Ecological Zones, it is essential that the Sacramento and San Joaquin Valley Basins also include shorebirds. Our 1993 surveys show that within the Greater Central Valley system (Delta, Suisun and Central Valley wetlands), the San Joaquin Valley held between 47% and 58% of shorebirds, the Sacramento Valley held between 26% and 42% of shorebirds, while the Delta held between 3% and 14%, and Suisun Marsh held between 7% and 10% of shorebirds.

References:

Page, Gary W., W. David Shuford, and J. E. Kjelson. February 1994. Results of the April, August, and November 1993 Shorebird Counts in the Wetlands of California's Central Valley.

2. Integration with Other Restoration Programs

In addition, the "Integration with Other Restoration Programs" sections for the Sacramento-San Joaquin Delta, the San Joaquin River, the East San Joaquin Basin and the West San Joaquin Basin Ecological Zones (which already include neotropical migrants as target species), as well as the Sacramento River, North Sacramento Valley, and Eastside Delta Tributaries Ecological Zones, should each cite coordination with the Riparian Habitat Joint Venture. The Riparian Habitat Joint Venture appears to have been almost entirely omitted from volume II of the draft Ecosystem Restoration Program Plan. Yet, participating organizations and agencies of the RHJV have already designated and supported, both financially and otherwise, significant riparian restoration and monitoring projects in each of these ecological zones. The RHJV *Riparian Bird Conservation Plan* will contain recommendations for high priority riparian protection, restoration and management goals in all seven of the ecological zones cited above, and we wish to work with CALFED so that these goals can be dovetailed with those of the Bay-Delta Program.

Likewise, the "Integration with Other Restoration Programs" section for the Suisun Marsh/North San Francisco Bay Ecological Zone should cite coordination with the San Francisco Bay Wetlands Goals Project. PRBO has been a participant in this effort, and we are currently working with other stakeholders in the process to develop a comprehensive standardized monitoring program for projects undertaken throughout the Bay. This will facilitate comparison of data and analysis of trends and problems on a Bay-wide scale.

Developing a Strategic Plan for Ecosystem Restoration

We have been attempting to work closely with both the Indicators group and the Comprehensive Monitoring, Assessment and Research Program (CMARP) to assist in development of an adaptive management monitoring program that will include birds as indicator species and as beneficiaries of habitat restoration actions. We respectfully request that we be added to the list of parties to be notified of or invited to participate in workshops concerning development of the Strategic Plan or CMARP. We support the concept of using reproduction in neotropical migratory birds (and native resident birds) as an attribute to be included in a conceptual model of riparian forest habitat (p. 9). We are ready to provide input to the development of such a model. PRBO biologists could participate as technical experts in developing specific components of the conceptual models and indicators of ecological integrity for the Bay-Delta-River system.

To summarize previous correspondence in this matter, the following are our arguments for including a significant bird monitoring component as part of CALFED's overall strategy for adaptive management:

1. Wildlife response to ecosystem/habitat restoration and management is the ultimate measure of "success" for two reasons: (1) wildlife has both intrinsic and deep cultural value and (2) wildlife response can be used as an indicator of ecosystem response, i.e. more complex qualities that are difficult to measure such as "ecosystem function" or "habitat value".
2. Among wildlife species, birds stand out as having tremendous importance and value, due to their pervasiveness in world cultures; their beauty; the recreational opportunities they provide; their key ecological roles (such as seed dispersal); their contributions to the global economy (such as agricultural pest control); etc. As such they deserve to be a central focus of any ecosystem restoration effort.
3. Birds are also highly sensitive indicators of environmental change, and can demonstrate the results of restoration projects relatively rapidly, demonstrating biological success in as little as three years. For example, working with The Nature Conservancy and the U.S. Fish and Wildlife Service, PRBO has demonstrated that a newly restored riparian site along the Sacramento River increased in bird species diversity by 73% from year 2 to year 4 of the restoration project. Revegetated sites ranging in age from 4 to 10 years supported species diversity comparable to mature riparian habitat.
4. Bird monitoring techniques are cost-effective and less expensive than many other forms of monitoring.

5. Monitoring used to mean simply determining presence, absence or abundance of species, but *ecosystem function* cannot be monitored solely by using these measures. Bird monitoring techniques have evolved to allow measurement of key parameters of *ecosystem function*. The survival and reproductive success of birds is key to determining what is required to maintain viable populations. Bird monitoring techniques allow determination of statistically significant, scientifically valid measures of demographic parameters, such as survival, dispersal, recruitment and reproductive success--all key components of *ecosystem function*. In the past, for example, major problems in ecosystems such as eggshell thinning due to DDT were discovered by studying reproduction of birds, not by monitoring their presence or their abundance. These demographic parameters are all crucial measures of *ecosystem function*.

6. Assessment of bird response can be used to measure the success of specific local habitat restoration projects, including restoration of natural processes such as flooding.

7. Since rare and listed bird species will be targets of the CALFED HCP, bird monitoring is the only valid means of measuring the success of actions undertaken to benefit these bird populations.

8. Because birds are so highly visible and popular with the public, assessment of their status can significantly increase public awareness and support of the Bay-Delta program and its achievements.

9. By managing for a diversity of birds, most other elements of terrestrial biodiversity are conserved.

The Point Reyes Bird Observatory has an extensive bird monitoring database including GIS vegetation layers and standardized bird data from over 250 sites in riparian habitats throughout California, much of it in the Central Valley. We are in the process of developing a predictive model that will (1) clarify uncertainties as to causes in species declines/increases or reproductive failure/success, generating hypotheses that can be tested, (2) allow predictions of bird species diversity and abundance based on key habitat characteristics, and (3) inform recommendations for habitat protection, restoration and management.

California and Federal Endangered Species Act Compliance

Page 8 states that the Habitat Conservation Plan developed for the Bay-Delta Program will need to "collect and synthesize biological information for those species which are to be covered by the permit (including information on life history, habitat requirements, distribution, and population trends--both range-wide and within the plan area, as necessary to assess the impact of the proposed take.)" It is our understanding that the databases to be developed in support of the Conservation Strategy, as well as the required monitoring to ensure compliance, will be coordinated with development of the Comprehensive Monitoring, Assessment and Research Program. Again, we stress that we have an extensive database concerning the information listed above for numerous bird species that are likely to be addressed by the HCP (such as California Yellow Warbler, Suisun Song Sparrow, Yellow-Billed Cuckoo, etc.).

CALFED Water Quality Program

In developing the comprehensive monitoring and research programs to achieve reduction of toxics in the Bay and Delta, consideration should be given to including use of seabirds as indicators of toxic contaminants. Brandt's cormorants, double-crested cormorants, and night herons in particular are valuable for this purpose. Seabirds have been used all over North America as samplers of contaminants. They bioaccumulate toxics, which are directly linked to biocontaminants in fish which form their diet. Toxics are lipophilic and can be retrieved from eggs and livers of the birds. Seabirds make sensitive indicators of the presence of toxics since they are at higher trophic levels in the food chain. It is often easier and cheaper to obtain egg samples from birds than samples of designated fish species (the cost of testing for presence of contaminants remains the same). Monitoring of birds can also provide greater spatial and temporal resolution of the occurrence of contaminants due to their restriction to specific territories for feeding and nesting purposes.

Thank you for your attention to these comments.

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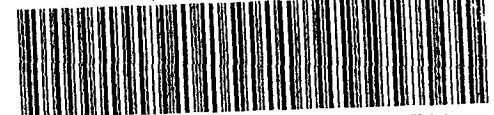
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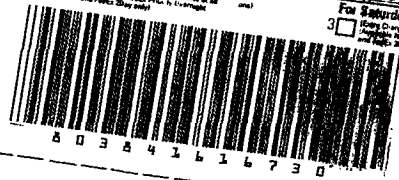


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☐ **FedEx Express Saver Freight** Third business day delivery (not available to all locations)

☒ **Special Handling**
Does this shipment contain dangerous goods? ☐ No ☐ Yes
Dry Ice ☐ Yes ☐ No
CA Cargo Aircraft Only

☒ **Payment**
Sender's Account No. ☐ Recipient's Account No. ☐ Third Party ☐ Credit Card ☐ Check

Total Packages ☐ Total Weight ☐ Total Charges ☐

Release Signature ☐

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The Work on Time.

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